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CLEAN VERSION OF PENDING CLAIMS

DEVICES HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION
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Claims 2-6, 10-18, 29, 30, 32-38, 50-52, 76 and 77, as of August 19, 2002 (Date of Response to Final Office Action).

2. A method for forming a capacitor, comprising:

forming on a substrate assembly an electrically isolated conductive layer of a first material;

forming a conformal metal layer of a second material atop the conductive layer; and

forming a dielectric by oxidizing at least a portion of the conformal metal layer.

3. The method as specified in Claim 2, further comprising forming a second conductive layer overlying the dielectric.

4. The method as specified in Claim 3, wherein forming the second capacitor plate comprises depositing a material to form the capacitor plate.

5. The method as specified in Claim 2, further comprising forming the metal layer from at least one of titanium, copper, gold, tungsten and nickel.

6. The method as specified in Claim 2, further comprising applying a potential across an electrolytic solution and the metal layer to oxidize said metal layer.

10. A method for fabricating a wafer, comprising:

forming a metal layer overlying a first conductive layer of a starting substrate; and

oxidizing the metal layer by applying a potential across an electrolytic solution and the

metal layer.

11. A method of fabricating a wafer, comprising:

forming a metal layer of a first material overlying a first conductive layer of a second material formed on a starting substrate;

contacting the metal layer with an electrolytic solution;

applying a potential across the electrolytic solution and the metal layer; and

oxidizing at least a portion of the metal layer in response to said applying to form an oxidized layer.

12. The method as specified in Claim 11, further comprising forming the first conductive layer from polysilicon.

13. The method as specified in Claim 11, further comprising forming a second conductive layer overlying the oxidized layer.

14. The method as specified in Claim 11, wherein a non-oxidized portion of the metal layer forms at least a portion of the first conductive layer.

15. The method as specified in Claim 11, wherein applying the potential further comprises:

connecting a first electrode in contact with the electrolytic solution to a first terminal of a potential source; and

connecting the starting substrate to a second terminal of the potential source.

16. The method as specified in Claim 15, further comprising:

positioning a second electrode to contact the electrolytic solution; and

connecting the second electrode to the potential source.

17. The method as specified in Claim 11, further comprising the step of adjusting the potential across the electrolytic solution to control the oxidation of the metal layer.

18. The method as specified in Claim 17, further comprising:

monitoring a current in the electrolytic solution; and

adjusting the potential of the electrolytic solution to maintain a desired amount of the current.

29. A method for forming a capacitor, comprising:

forming a first electrically conductive layer of a first material;

forming a metal layer of a second material overlying the first electrically conductive layer;

contacting the metal layer with an electrolytic solution;

applying a potential across the electrolytic solution and the metal layer; and

oxidizing at least a portion of the metal layer to form an oxidized layer in response to said applying, said oxidized layer forming at least a portion of a dielectric layer of the capacitor, and the electrically conductive layer forming a lower capacitor plate.

30. The method as specified in Claim 29, further comprising forming a second electrically conductive layer overlying the dielectric layer to form an upper capacitor plate.

32. A method for forming a capacitor, comprising:

forming an electrically isolated conductive layer of a first material in contact with a starting substrate;

forming a conformal metal layer of a second material overlying the conductive layer;

contacting the metal layer with an electrolytic solution;

applying a potential across the electrolytic solution and the metal layer;

conducting current in the electrolytic solution in response to applying the potential; and

oxidizing a portion of the metal layer to form a metal oxide in response to said conducting current, the metal oxide constituting a capacitor dielectric, and an unoxidized portion of the metal layer and the conductive layer constituting a first capacitor plate.

33. The method as specified in Claim 32, further comprising the step of forming a second capacitor plate overlying the capacitor dielectric.

34. The method of Claim 32, wherein the metal layer is an initial metal layer and wherein the electrolytic solution is an initial electrolytic solution and wherein the metal oxide is an initial metal oxide, and further comprising:

forming a further metal layer to overly the initial metal oxide;

contacting the further metal layer with a further electrolytic solution;

applying a potential across the further electrolytic solution and the further metal layer;

conducting current in the further electrolytic solution in response to said step of applying a potential across the further electrolytic solution; and

oxidizing, in response to said step of conducting current, at least a portion of the further metal layer to form a further metal oxide, the further metal oxide forming a further portion of the capacitor dielectric.

35. The method as specified in Claim 34, further comprising the step of forming a second capacitor plate overlying the capacitor dielectric.

36. The method as specified in Claim 34, wherein the further electrolytic solution and the initial electrolytic solution are the same solution.

37. (Amended) A method for forming a capacitor, comprising:

forming an insulative layer overlying a substrate;

masking the insulative layer to define a region in which to fabricate the capacitor;

removing the insulative layer in an unmasked region to expose the substrate;

depositing a polysilicon layer overlying the insulative layer and the substrate and contacting the substrate;

removing portions of the polysilicon layer to expose the insulative layer;

chemical vapor depositing a metal layer to overlie the polysilicon layer and the insulative layer;

contacting the metal layer with an electrolytic solution;

applying an electrical potential to the electrolytic solution and the metal layer; and

oxidizing, in response to said applying, at least a portion of the metal layer to form a metal oxide to function as a dielectric layer.

38. The method as specified in Claim 37, further comprising forming a conductive layer overlying the metal oxide layer.

50. (Amended) The method of claim 38, wherein the metal layer includes titanium.

51. (Amended) The method as specified in Claim 50, further comprising:

forming the metal layer from at least one of titanium, copper, gold, tungsten and nickel.

52. The method as specified in Claim 51, further comprising forming the conductive layer from polysilicon.

76. (Amended) A method of forming a capacitor, comprising:

forming a polysilicon layer overlying a substrate, the polysilicon layer having portions

electrically isolated from one another;

forming a conformal metal layer atop the polysilicon layer portions;

electrolytically oxidizing at least a portion of the conformal metal layer; and

covering the oxidized portion of the metal layer with a conductive layer.

77. The method as specified in claim 76, wherein forming the conformal metal layer includes depositing one of titanium, copper, gold, tungsten and nickel.